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HYDRO IN ONTARIO A POLICY FOR MAKE OR BUY

REPORT NUMBER FIVE



Established by
the Committee on
Government Productivity
of Ontario.



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REPORT NUMBER FIVE

*REPORT TO THE EXECUTIVE COUNCIL ON
HYDRO IN ONTARIO – A POLICY FOR MAKE OR BUY*

*PRESENTED TO THE EXECUTIVE COUNCIL
JUNE 29, 1973*



COMMITTEE ON GOVERNMENT PRODUCTIVITY

ONTARIO

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TO HIS HONOUR

THE LIEUTENANT-GOVERNOR OF THE PROVINCE OF ONTARIO

MAY IT PLEASE YOUR HONOUR:

We, the members of the Committee on Government Productivity, appointed by Order-in-Council, dated 23rd December, 1969, to inquire into all matters pertaining to the management of the Government of Ontario and requested in the Speech from the Throne, dated 30th March, 1971, to review the function, structure, operation, financing and objectives of the Hydro-Electric Power Commission of Ontario, submit to Your Honour, herewith, the fifth and last report of Task Force Hydro containing their recommendations relating to a future policy for 'Make or Buy' for the Hydro-Electric Power Commission of Ontario ('Make' representing the use of internal resources, and 'Buy' the use of external resources).

We have examined this report and endorse the general principles and recommendations. They are entirely consistent with those expressed in our ten reports, including the emphasis on the utilization of Hydro's expertise by the private sector for commercial development in domestic and export markets.

A handwritten signature in black ink, appearing to read 'John Blaikie'.

Chairman

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TASK FORCE HYDRO

Established
by the Committee
on Government
Productivity of
Ontario

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TO JOHN B. CRONYN, ESQ.,

CHAIRMAN OF THE COMMITTEE
ON GOVERNMENT PRODUCTIVITY

On behalf of the Steering Committee of Task Force Hydro which was appointed by the Government of Ontario to review the function, structure, operation, financing and objectives of the Hydro-Electric Power Commission of Ontario, we submit herewith a fifth report entitled 'Hydro in Ontario - A Policy for Make or Buy'.

This report concludes the formal review of Hydro in Ontario by Task Force Hydro.

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SECTION I

INTRODUCTION

The 'Make or Buy' policies and practices of Ontario Hydro were examined by the 'Make or Buy' Study Team in accordance with the following terms of reference:

"To review the Commission's policies and procedures regarding 'Make or Buy' decisions in order to recommend policies that will generate the best economics for Ontario Hydro and the Province without impairing quality¹ standards."

In an electric utility of the size of Ontario Hydro, a wide range of needs for equipment, facilities and services must be satisfied each year. The 'Make or Buy' question concerns the identification of these needs and the selection of the most appropriate means of meeting them — whether using internal resources ('Make'), external resources ('Buy') or some combination of the two.

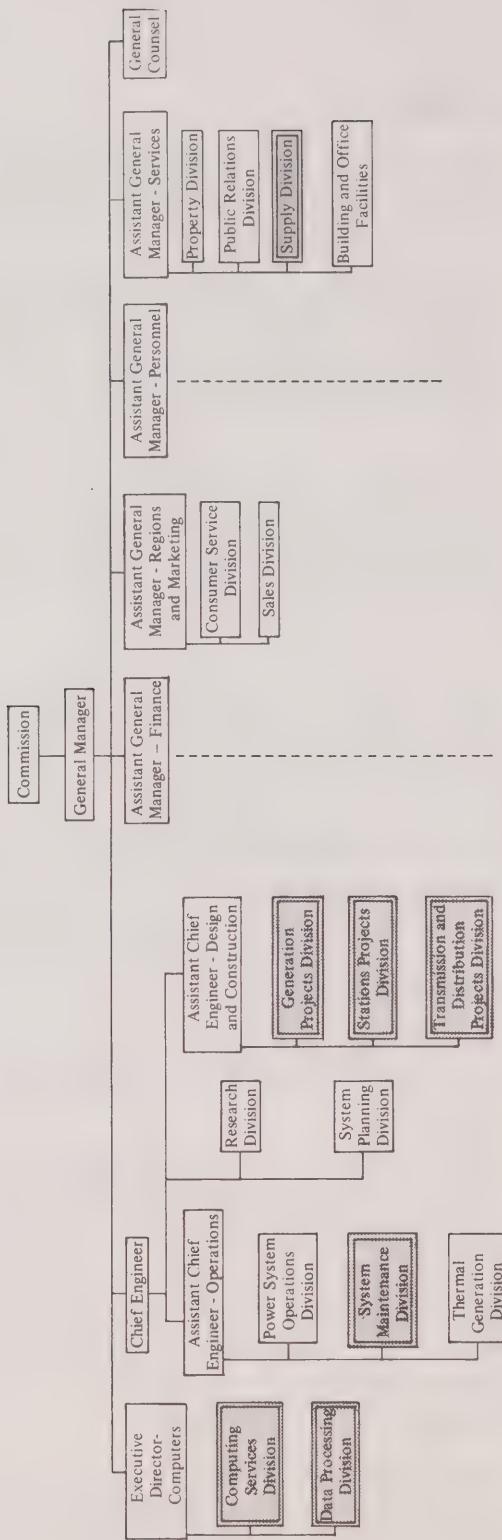
The benefits of a decision-making framework which allows for explicit 'Make or Buy' decisions are widely recognized. Principal among these is that a 'Make or Buy' policy can foster a competitive environment which promotes efficient service from 'in-house' service groups and, at the same time, inhibits the uneconomical growth of such groups. To illustrate, the Committee on Government Productivity recommended that programme managers be encouraged to acquire services wherever the criteria of cost, quality and delivery are best met, either within Government or in the private sector. For electronic data processing, the C.O.G.P. expressed its 'Make or Buy' recommendation this way:

"(We recommend that²) Competition for government business be encouraged between government and commercial computer centres."

The benefits to be achieved through a 'Make or Buy' policy can also be expressed in terms of an increased degree of control by the user. Clearly, there is a better chance of the user controlling his in-house purchases in the best interests of the Corporation, if a 'Buy' alternative exists. It is also true that the user runs less risk of becoming a captive of an outside supplier if an economic 'Make' alternative is available. There are also potential advantages for the Province as a whole, which can arise through the transfer of Hydro technology to the private sector.

The 'Make or Buy' Study was confined principally to an examination of four Divisions of the Engineering Branch, the Computer Function and the Supply Division of the Services Branch. (See Figure 1.) The emphasis was on the three Design and Construction Divisions one of which, the

**FIGURE 1: ONTARIO HYDRO
PARTIAL ORGANIZATION CHART
SHOWING SCOPE OF 'MAKE OR BUY' STUDY
DECEMBER 1972**



Shaded boxes indicate Divisions studied by the 'Make or Buy' Study Team

Generation Projects Division, alone accounted for 31.4% of total Hydro expenditures in 1971.

The Study Team looked at present policies and practices and their impact within Hydro and on outside groups by analyzing selected current activities or projects where 'Make or Buy' alternatives were relevant. It attempted to identify the key factors which influence the feasibility of 'Make or Buy' options. Senior Hydro personnel were involved at all stages of the Study. As shown in Appendices IV and V, a number were assigned as members of the Study Team and technical liaison committees were established for each area examined. These committees acted in an advisory capacity during the study and will be available to undertake significant responsibility for implementation.

Four additional sources of information were utilized: other electric utilities in Canada and the U.S.; the private sector — manufacturers, contractors, suppliers and consulting engineering firms; submissions from the public to Task Force Hydro; and Ministries of the Government.

In the preliminary stages of planning this study it became clear that Hydro's operations were so extensive and complex that an exact breakdown and analysis of 'Make or Buy' activities would not be practicable in all areas. Some approximation was necessary, but we are content that the data presented by the Study Team give a reasonable and reliable picture of Hydro's 'Make' and 'Buy' activities.

Our recommendations have been framed in the light of the broader role envisaged for Ontario Hydro in Report Number One.³ In general, we seek to encourage Hydro to adopt the 'Buy' alternative to a greater degree than in the past with a view to transferring Hydro technology to the private sector and enhancing Hydro's internal cost effectiveness. The achievement of this goal will not be easy, nor can it be accomplished immediately in some cases. There will be a need to develop resources external to Hydro before 'Buy' decisions become practical in many areas. In addition, Hydro will have to continue to 'Make', for reasons of reliability or system security, in such areas as system planning, project management and conceptual engineering.

However, the ability of Hydro to meet new objectives pertaining to social and economic policy is dependent on the existence of 'Make' or 'Buy' options, quite apart from any potential financial benefits.

Certain of our recommendations imply fundamental changes from current Hydro policies but others are essentially modifications of current Ontario Hydro practices. The implementation of some of the recommendations in this Report will therefore involve little change for Hydro.

It is also important to recognize that the basis for decisions to 'Make' or to 'Buy' are frequently imprecise. There is often insufficient information to be able to state categorically which alternative represents the least cost and judgement must play a significant role. Our recommendations are intended to provide a basis for an explicit 'Make or Buy' policy which would facilitate rational 'Make or Buy' decisions and provide maximum guidance upon which value judgements can be made.

This report and its recommendations arise from the working papers produced by the 'Make or Buy' Study Team. The latter contain considerable detail and will serve as a guide for Hydro in the implementation of the recommendations.

FOOTNOTES

- ¹. In this context the Steering Committee considered quality standards to encompass standards of safety and reliability.
- ². Committee on Government Productivity, Report to the Executive Council on Automatic Data Processing, Interim Report Number Five, February 1972, p.16.
- ³. Task Force Hydro, Hydro in Ontario – A Future Role and Place, Report Number One, August 15th, 1972.

SECTION II

THE CURRENT SITUATION AND 'MAKE OR BUY' POTENTIAL

We have gained the impression that Hydro generally has had a propensity to 'Make' rather than to 'Buy', although certain elements of the organization, discussed later, have developed policies which provide managers with clear 'Make or Buy' alternatives. There are two closely allied reasons for this. First, many of Hydro's activities are so highly specialized that relevant skills have not been available from the private sector. Second, Hydro managers tend to rely on internal resources in order to achieve safety and system reliability. This is something of a vicious circle, for the less Hydro avails itself of the services of the private sector, the less opportunity there will be for suppliers in the private sector to develop the skills required by Hydro. This is one of the difficulties facing Hydro in developing a more positive 'Make or Buy' stance.

Assessment of 'Make or Buy' Activities in Design and Construction

The Study Team identified those activities which, under any circumstances, should be undertaken by Hydro personnel. These constituted a category of activities which will be referred to as 'Minimum Make'. Similarly, they classified as 'Minimum Buy' those areas where for economic, technical or other reasons a buy decision would always be made. Having defined 'Minimum Make' and 'Minimum Buy' the remaining areas were then classified as potential 'Make or Buy'. Implicit in this analysis were certain assumptions:

- There are no constraints on the availability, expertise or capacity of external resources;
- Hydro's role is restricted to that of an electric utility 'owner-operator' involved in design and construction only to the extent necessary to ensure the safety, security and economy of the system; and
- No 'Make' activity is undertaken to ensure the maintenance of Hydro's technical capability.

Current 'Make or Buy' Policies for Design and Construction

Responsibility for designing and constructing generation transformation and transmission facilities in accordance with policy guidelines defining quality of service, safety, environmental impact, schedules and cost, falls to the three Design and Construction Divisions of the Engineering Branch, Generation Projects, Transmission and Distribution Projects, and

Station Projects. Their function should not be confused with that of the System Planning Division which is to plan new facilities.

There is an 'Owner Requirements Policy' for the Design and Construction Divisions which defines the requirements of Ontario Hydro as 'owner-operator' of an electric utility system, with responsibility for meeting demand with a certain standard of reliability and at lowest feasible cost. No decision, either to 'Buy' or to 'Make', is taken which might jeopardize the fulfillment of these obligations.

The practice is to delay approval for the implementation of major design and construction projects as long as possible to allow decisions to proceed to be made on the basis of latest information. In this way Hydro seeks:

- To minimize current capital requirements and cost of money;
- To allow the maximum detail and certainty in definition of future power requirements;
- To allow full consideration of ecological, sociological and socio-political needs which could become more extensive in terms of Hydro's newly defined mandate; and
- To take full advantage of advancing technology and operating experience.

This practice undoubtedly contributes to Hydro's current tendency to 'Make'.

The 'Design and Construction Policy' was first set out in 1958 by the then Chairman of Hydro, in his presentation to the Committee on Organization of Government in Ontario. As supplemented in 1970, the Policy requires that Hydro undertake its capital programme with a combination of its own staff and contract forces. It is also Commission policy to undertake a significant portion of the work with its own engineering and construction organization, particularly work of a repetitive nature or work which requires close co-ordination with the operating staff.

Contractors and consulting engineers however are engaged when one or more of the following conditions apply:

- The work exceeds the capacity of the Design and Construction Divisions;
- There are peak work load situations;
- Work is specialized and requires special equipment, knowledge and techniques;

- Work is not of a continuing nature; and
- It has been determined that work can be performed more economically by contract.

The 'Major Equipment Acquisition Policy' calls for the purchase of detail design, fabrication and, where possible, the installation of units such as turbines, generators, boilers, and transformers. Performance and service specifications are prepared by Hydro personnel. Equipment purchases of this kind account for a considerable proportion of Hydro's total 'Buy' expenditures.

The requirements for products, facilities and services for the Design and Construction Divisions, given the present size of the system and its annual growth rate of approximately 7 percent, is enormous and it is here that 'Make or Buy' is most pertinent. For this reason the Study Team examined each of the Divisions in detail.

Generation Projects Division

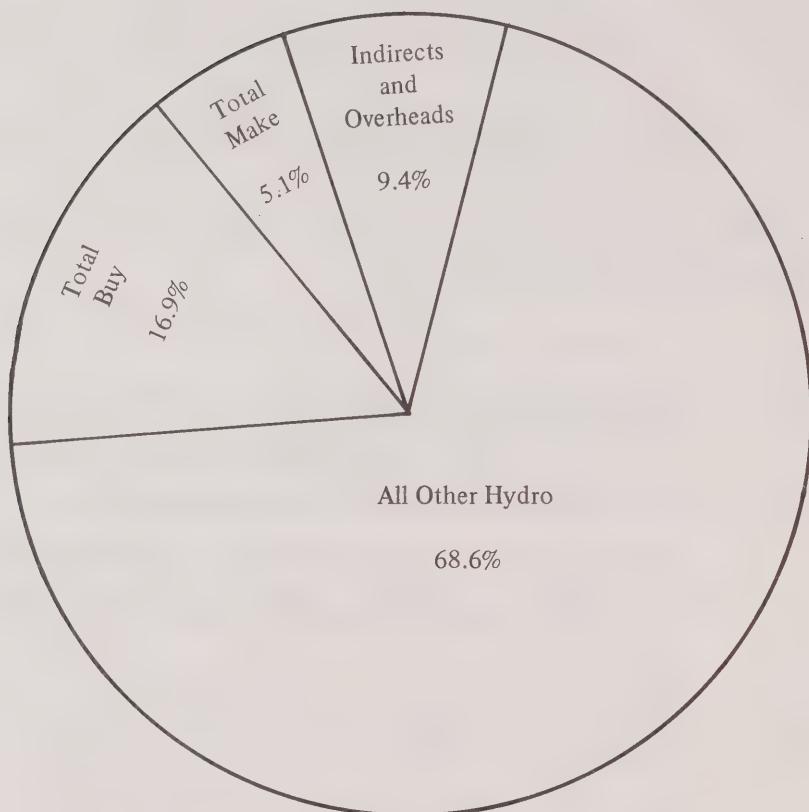
The Generation Projects Division is responsible for the design and construction of generating plants. It is the largest division, both in terms of organization and budget, being responsible, as shown in Figure 2, for 31.4% of Hydro's total expenditures in 1971.

The potential for Generation Projects 'Make or Buy' decisions was derived from an analysis of projects executed between 1964 and 1971. This approach was taken because Hydro's capital expenditure forecasts are set out in aggregate terms which do not reflect projected expenditures on individual projects and because the Study Team wanted to interpret 'Make or Buy' opportunities not so much in monetary terms as in terms of activities. While no attempt was made to pass judgement on past 'Make or Buy' decisions, the rationale for such decisions was identified for each class of work in each project.

The results of the analysis are shown in Table 1. In broad terms:

- Approximately 9 percent of the capital expenditures for generation stations will continue to be for products, facilities and services provided by resources within Hydro, even if a policy of utilizing internal resources to the minimum extent feasible is adopted. In other words, 'Minimum Make' is roughly 9 percent, even if the policy is 'Maximum Buy'.
- About 59 percent of the expenditures will continue to be for products, facilities and services provided by resources external to Hydro, even if the policy is to utilize these resources to the

FIGURE 2: COMPARISON OF GENERATION PROJECTS EXPENDITURES AND TOTAL HYDRO EXPENDITURES IN \$ THOUSANDS 1971



	\$	
TOTAL HYDRO EXPENDITURES.....	1,198,992	100%
GENERATION PROJECTS EXPENDITURES	376,287	31.4%
GENERATION PROJECTS EXPENDITURES BREAKDOWN		
A TOTAL "BUY"	202,864	54.0%
B TOTAL "MAKE"	60,980	16.2%
C INDIRECTS AND OVERHEADS	<u>112,443</u>	<u>29.8%</u>
TOTAL	<u>376,287</u>	<u>100.0%</u>

TABLE 1: ANALYSIS OF POTENTIAL 'MAKE OR BUY' AND COMPARISON WITH ACTUAL
SELECTED GENERATION PROJECTS EXPERIENCE IN \$ THOUSANDS
1964 to 1971

	Total Expenditure \$*	Minimum Make \$	Minimum Buy \$	Make or Buy Potential \$	Minimum Buy \$	Make \$	Actual Buy \$
Fossil Fired Plants (1)	582,494	40,400	219,094	323,000	169,514	412,980	
Nuclear Fired Plants (2)	582,054	69,700	150,354	362,000	200,783	381,271	
Miscellaneous Projects (3)	20,500	1,900	7,200	11,400	5,597	14,903	
TOTAL GENERATIONS PROJECT 1964 to 1971	1,185,048	112,000	376,648	696,400	375,894	809,154	
	(9.5%)	(31.5%)	(59%)	(31.5%)	(31.5%)	(68.5%)	
							(100%)
							(100%)

(1) Based on Nanticoke Detailed Analysis

(2) Based on Pickering Detailed Analysis

(3) Based on R.L. Hearn Gas conversion and stack and ducting projects

* Excluding interest costs, hydraulic projects and combustion turbines.

minimum extent possible. 'Minimum Buy' therefore is approximately 59 percent, even if the policy is 'Maximum Make'.

- Roughly 32 percent of the expenditures will be for products, facilities and services provided entirely by internal resources or entirely by external resources, or any mix of the two, that is to say the 'Make or Buy' potential is approximately 32 percent.

Thus, for Generation Projects, 'Make or Buy' can range roughly from 9% 'Make'/91% 'Buy' to 41% 'Make'/59% 'Buy'. Over the past several years, as shown in Table 1, it has been 32% 'Make' and 68% 'Buy'.

Transmission and Distribution Projects Division and Stations Projects Division

The Transmission and Distribution Projects (T & D Projects) Division is responsible for the design and construction of transmission lines and distributing stations as well as for planning the subtransmission system. It is also responsible for constructing transformer stations and providing survey services. The Stations Projects Division is responsible for the design of transformer stations, switching stations, relay and communication facilities and the design of the electrical features of generating stations. It is also responsible for providing architectural services.

Because of the many projects processed annually by these Divisions and the relatively small size of their individual projects, the analysis for 'Make or Buy' was done on an overall basis for the year 1971 only. In all other respects, the approach for the analysis was similar to that used for Generation Projects. The results of the analysis, summarized in Table 2 below, are shown in detail in Tables 3 and 4.

**TABLE 2: SUMMARY OF ANALYSIS
POTENTIAL 'MAKE OR BUY' AND COMPARISON
WITH ACTUAL T & D PROJECTS AND STATION
PROJECTS DIVISIONS
1971**

Division	Minimum	Make or Buy	Minimum	Actual	
	Make %	Potential %	Buy %	Make %	Buy %
T & D Projects	25	36	39	55	45
Station Projects	19	22	59	36	64

TABLE 3: ANALYSIS OF POTENTIAL 'MAKE OR BUY' AND COMPARISON WITH
ACTUAL T & D PROJECTS IN \$ THOUSANDS
1971

Head Office	Annual Expenditure	Minim Make		Minimum Buy		Actual Buy
		Make	Buy	Make	Buy	
Total H.O. Costs	4,110	4,110	—	—	4,110	—
Engrg. and Survey						
Total Engr. & Survey	5,498	3,798	—	1,700	4,798	700
Materials and Equip.						
Total Matsls. & Equip.	19,981	—	19,981	—	—	19,981
*Construction Cost						
Total Const. Cost	21,973	4,970	—	17,003	19,473	2,500
Total Applicable Costs	51,562	12,878	19,981	18,703	28,381	23,181
	(25%)	(39%)	(36%)	(55%)	(45%)	
						(100%)
Property Interest	2,433	2,107	56,102			

* Transformer and switching station construction is handled by the same organization –
see Summary on Stations Projects.

TABLE 4: STATIONS PROJECTS DIVISION
CAPITAL CONSTRUCTION PROGRAM BREAKDOWN BY FUNCTION IN \$ THOUSANDS
1971

<u>Identification</u>	<u>Expenditures</u>	<u>Min. Make</u>	<u>Min. Buy</u>	<u>Make or Buy Potential</u>	<u>Current</u>	<u>Buy</u>
H.O. Overheads, Interest, Including T & D Construction H.O. Charges, Property Acquisition, Supply Inspection and Research	5,912	5,912	—	—	5,912	
Project and Development Engin- eering, Basic Layout, Relay and Communications Equipment Procurement	2,974	2,974	—	—	2,974	
General Engineering, Archi- tectural and Misc. Services	3,760	376	—	3,384	2,730	1,030
Equipment and Material	34,554	—	34,554	—	—	34,554
T & D Division Construction Services	11,800	1,780	300	9,720	9,700	2,100
Total 1971 CCP	59,000	11,402	34,854	13,104	21,316	38,684
	(19%)	(59%)	(22%)	(36%)	(64%)	(100%)
						(100%)

Hydro Maintenance Practices and Levels of 'Make or Buy'

Maintenance activities in Hydro are divided into three categories: maintenance engineering, centralized maintenance and regional and plant maintenance. The first two are largely the responsibility of the System Maintenance Division of the Engineering Branch. In the latter function, the Regions carry out the maintenance of transmission and transformation equipment and hydraulic generating plants and the Thermal Generation Division performs maintenance for fossil-fired and nuclear plants.

The System Maintenance Division provides central maintenance services and sets standards for the maintenance activities of the Regions and other units in Hydro. The Division directs and coordinates power system maintenance with due regard to reliability, economics and the environment. It is responsible for providing a maintenance consulting service to the Regions and to the Thermal Generation Division. It also provides specialized field testing and maintenance services. The Division consists of five Sub-units, the Forestry Department, the Line Department, the Electrical Department, the Mechanical Department, and Central Maintenance Services.

- The Mechanical, Electrical and Line Departments are responsible for developing and monitoring standards and procedures for the maintenance of plant and equipment. The maintenance is carried out by the Regions through departmental functional groups.
- The Forestry Department is responsible for line clearing, rights-of-way maintenance, management of Commission-owned woodlots and grounds landscaping.
- The Central Maintenance Services Department was established in 1971 to take responsibility for the repair or modification of certain major mechanical or electrical equipment, for providing and operating a storage facility for reserve equipment and for the operation and maintenance of the helicopter fleet. These services are now provided at various locations, but with the exception of helicopter maintenance they are to be centralized in a new Central Maintenance Facility to be constructed at Pickering.

The Study Team's methodology was to subdivide the programme for each department into packages of size and content suitable for contracting. For each package, dollars budgeted or actually spent for 1971 were determined, as well as dollars spent on contract work. Wherever possible, the potential 'Buy' was determined but in some areas the large number of work categories or the reporting system prevented ready access to the information sought. The results are summarized in Table 5.

Running Maintenance

In general, running maintenance of operating plant and equipment is carried out by Hydro personnel. Through this practice Hydro ensures that tradesmen are adequately trained and that they are thoroughly familiar with the rigidly specified procedures and safety codes necessary when working with live equipment.

In Line Maintenance, civil engineering work in connection with underground cable maintenance and repair is currently contracted to outsiders. The Electrical Maintenance Department tends to 'Buy' materials and specialized equipment and to install with its own forces. In the Mechanical Maintenance Department, although a considerable volume of work is already contracted, 'Buy' potential exists through expansion of contract work for buildings and related maintenance. The level of 'Buy' for maintenance labour and material in the various areas is indicated in Table 5.

Buildings and Grounds Maintenance

Buildings and grounds maintenance and related work is contracted out in many cases where qualified contractors can be engaged and economic and quality criteria can be met.

Forestry

Hydro has developed controlled spraying and cutting programmes to suit all types of holdings from woodlots to landscaped urban areas. Little forestry work is currently contracted, although contractors are employed to carry out peak, seasonal or non-repetitive work, and some landscaping. Arboriculture companies with specialized experience in utility work are not well established in Ontario and there is no regulation of standards.

Equipment Repair

Hydro utilizes external equipment repair facilities where qualified resources are available and where Hydro does not have its own internal resources. Care is taken not to engage a single outside resource for all work of a particular type, in order to minimize possible risks to system security and to safeguard manufacturers' proprietary rights. This policy will be continued with the establishment of a Central Maintenance Shop in which to perform the major rehabilitation of transformers and overhaul of steam turbine rotors. During the course of the 'Make or Buy' assessment the Study Team was requested by Hydro to analyse a proposal which

TABLE 5: ANALYSIS OF EXPENDITURES - MAINTENANCE PROGRAM
- IN \$ THOUSANDS (Not including Thermal Stations)
1972

Function	Type of Work	1972 Budget In \$ Thousands Material + Labour		Buy '72 Budget Material Labour*		Potential Buy** Material Labour	
		Material	Labour*	Material	Labour*	Material	Labour
Electrical	Running mtcce Special projects	8,707 2,012	1,815 947	100 100		No change No change	Very little more Considerably more
	Running mtcce Special projects	9,841 1,876	42 109	148 366		No change No change	Considerably more Considerably more
Forestry	Running mtcce Special projects	21,562 45,650	5,412 22,642	776 1,096		No change No change	Some more Considerably more
	Running mtcce Special projects	1,060 320	105 105	191 215		No change No change	Some more No change
Line	Running mtcce Special projects	8,570 1,270	1,265 600	66 134		No change No change	Some more Considerably more
	Running mtcce Special projects						
Civil	Running mtcce Special projects						
	Running mtcce Special projects						
Mechanical	Running mtcce Special projects						
	Running mtcce Special projects						

* Includes work done by Ontario Hydro construction staff for special projects in Civil and Line Maintenance.

** Very Little — up to 5%
Some — 5-25%
Considerable — 25% or more

Note: Special projects are major works related to maintenance or modification of existing plant. They are authorized on an individual basis by Executive or Commission Approvals, or by release of funds from the Capital Construction Program.

had been prepared by the System Maintenance Division calling for a shop intended to provide all the facilities needed for this type of work up to 1980. The Study Team's recommendation for further study on 'Buy' potential for mechanical maintenance combined with a decision to purchase mobile equipment for mechanical maintenance led to a reduction in the size of the proposed shop facilities.

Helicopter Services

The bulk of Hydro's helicopter requirements can be classified into two broad categories — the patrol of transmission lines with light duty helicopters and the maintenance and modification of transmission lines with helicopters having a heavy lift capability. The Central Maintenance Services Department bought helicopter services as back-up for Hydro helicopters for line construction work until 1969. Since then, no helicopter service has been purchased from external sources, but recently, Hydro has announced it is negotiating a contract for helicopter patrol service in North-western Ontario.

Tendering Practices

In assessing tenders for maintenance contracts, the System Maintenance Division pays special attention to the previous experience of the bidders, having regard for the type of work involved and to their ability to provide key resources which often include specialized equipment. No pre-qualification system is used. Analysis of maintenance tenders and the capabilities of bidders is carried out by the System Maintenance Division in conjunction with the Supply Division. Various types of tenders are employed: unit, cost plus, and negotiated.

For considerations of safety and to ensure adherence to quality standards, certain System Maintenance Departments exercise authority over Regions and Plants by issuing lists of approved maintenance contractors. Local contractors are employed where practicable. In the area of grounds maintenance and snowploughing, the Regions control the majority of expenditures and engage local contractors.

Utilization of Available Hydro Resources

Before any maintenance contract is let, in such areas as line construction for example, a check is conducted to ensure that Hydro

personnel are not available to carry out the work. This practice results in more effective utilization of Hydro's manpower in the face of seasonal variations in work load. Composite programmes to train tradesmen in a number of skills further increase the effectiveness of manpower utilization but tend to reduce the need to rely on external resources.

'Make or Buy' Potential for Maintenance Services

Table 5 shows in qualitative terms the extent of potential 'Buy' for various kinds of maintenance labour. Almost 100 percent of materials are purchased. The areas with greatest immediate potential appear to be:

- Reforestation and large tree planting;
- Line maintenance including tower painting, rural line maintenance, rural storm damage, pole unloading and replacement;
- Specialized work in electrical maintenance; and
- Contract work for building and related maintenance.

Studies under way in Hydro may indicate potential savings through rental of helicopter services.

The Computer Function

Hydro's Computer Function is one of the largest single installations of its kind in Canada. As indicated in Figure 1, the Function has two divisions, Data Processing and Computing Services. The former is responsible for providing and operating computer facilities, the latter for programming service and designing systems and mathematical formats. There are two additional Departments within the Function reporting directly to the Executive Director. Management Services is responsible for developing clerical systems, work studies and for reviewing a unit's organization structure in the light of its objectives. Computer Planning is concerned with long- and short-range planning for hardware, software and services.

Some appreciation of the size of the Computer Function can be gained from Table 6 which shows an analysis of expenditures for 1971 amounting to almost \$14 million.

A compound annual growth rate of 25 percent in expenditures prevailed from 1964-71 but this is expected to be reduced to 5 percent between 1972-78, reflecting the recent maturity of the role of the Computer Function within Hydro.

**TABLE 6: COMPUTER FUNCTION
ANALYSIS OF 'MAKE OR BUY' AND INTERNAL
AND EXTERNAL EXPENDITURES IN \$ THOUSANDS
1971**

MAKE EXPENDITURES

A. External

Equipment Rental	4,109	
Interest & Depreciation		
• Space	155	
• Equipment	139	
Other	<u>388</u>	
Total External Make	4,791	34%

B. Internal

Salaries and Other Benefits	7,842	
Other	<u>303</u>	
Total Internal Make	8,145	58%

BUY EXPENDITURES

External Services	<u>1,059</u>	8%
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TOTAL EXPENDITURES	13,995	100%
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Current Policies and Practices

The Study Team found that 'Buy' decisions were the exception, not the rule. External resources are not routinely invited to submit proposals as an alternative to in-house facilities.

Until recently, Hydro has found it economical to adopt large multi-purpose systems designed to serve a wide range of users. These are complex and specialized and although they have served Hydro's needs well, they have generally failed to provide a desirable degree of flexibility. Since the system must serve everyone,

changes to suit a particular individual user are difficult to introduce, and the user's ability to seek the services of an outside computing facility are seriously curtailed. We are informed that Hydro intends to introduce smaller, single-user systems that will offer individual users greater scope in arriving at 'Make or Buy' decisions.

There are two basic approaches to the use of external resources: as a part of a Hydro project team including Computer Function personnel, or as a "turnkey" application where the supplier takes total responsibility. The Computer Function normally uses external resources in the former sense. "Turnkey" applications are occasionally employed by user groups, almost never by the Computer Function. Cases in which external resources have been used include the following:

- Temporary overload situations. These occur primarily in the Computing Services Division.
- Cases calling for specific technical skills or services not available within Hydro. These occur in both major Divisions.
- To fulfill a need for pre-packaged programmes or systems where development costs would be uneconomic. This might occur in either major Division.
- Under conditions of rapid growth, until such time as it proved economic to establish internal facilities.

Scope and Potential of 'Make or Buy'

In order to define precisely a 'Buy' option for the Computer Function, it is necessary to differentiate between 'external' expenditures and 'Buy' expenditures. For Hydro service groups, as opposed to operating groups, a 'Buy' option is defined as a service purchased from an agency external to Hydro. Equipment purchases by the Computer Function to provide an internal service are considered as external expenditures but form part of the cost of a 'Make' option. For Computers, 'Buy' is the use of external data centres, equipment *and* personnel to perform Hydro computing services.

Table 6 summarizes the Study Team's analysis of expenditures for 1971. External expenditures accounted for 42 percent of the total and internal expenditures 58 percent. 'Buy' expenditures for the same year represented just under 8 percent of the \$14 million spent in that year. In Table 7 this figure is broken down to show the nature of various expenditures.

**TABLE 7: COMPUTER FUNCTION
NATURE OF AND DISTRIBUTION OF EXPENDITURES
1971**

Nature of Expenditure	Amount in \$ millions	Percentage of Total
Equipment	4.2	30
Salaries & Benefits	7.9	56
Outside Services	1.1	8
Other	0.8	6
Total Expenditure	14.0	100

As Table 6 indicates, 'Buy' represented only 8 percent of total expenditures for the same year. This, roughly speaking, has been the percentage of 'Buy' since 1964. Table 8 shows a breakdown of 'Buy' expenditures over the period 1964-1971. Most of the \$5,700,000 spent was for time-sharing, communications and maintenance services not available within Hydro.

An analysis similar to that for Design and Construction led the Study Team to conclude that 'Minimum Make' within the Function is 15%-20% of the total expenditure. 'Minimum Buy' was seen from past experience to be less than 10%. Excluding time-sharing which the Function could undertake, 5% seemed a reasonable figure. This means that about 75% of total expenditures could be shifted to either category by Hydro managers. In the case of Management Services and Computing Services it is not difficult to visualize how this might be achieved, since their expenditures are for people. The situation is not so simple for Data Processing where there are considerations of data control, data centre reliability, communications and other technical complexities. The greatest potential for increased levels of 'Buy' appears to be in the hands of managers in the Computer Function, but it is also possible, given the right conditions, that user groups will find it desirable to purchase computer services directly from external sources.

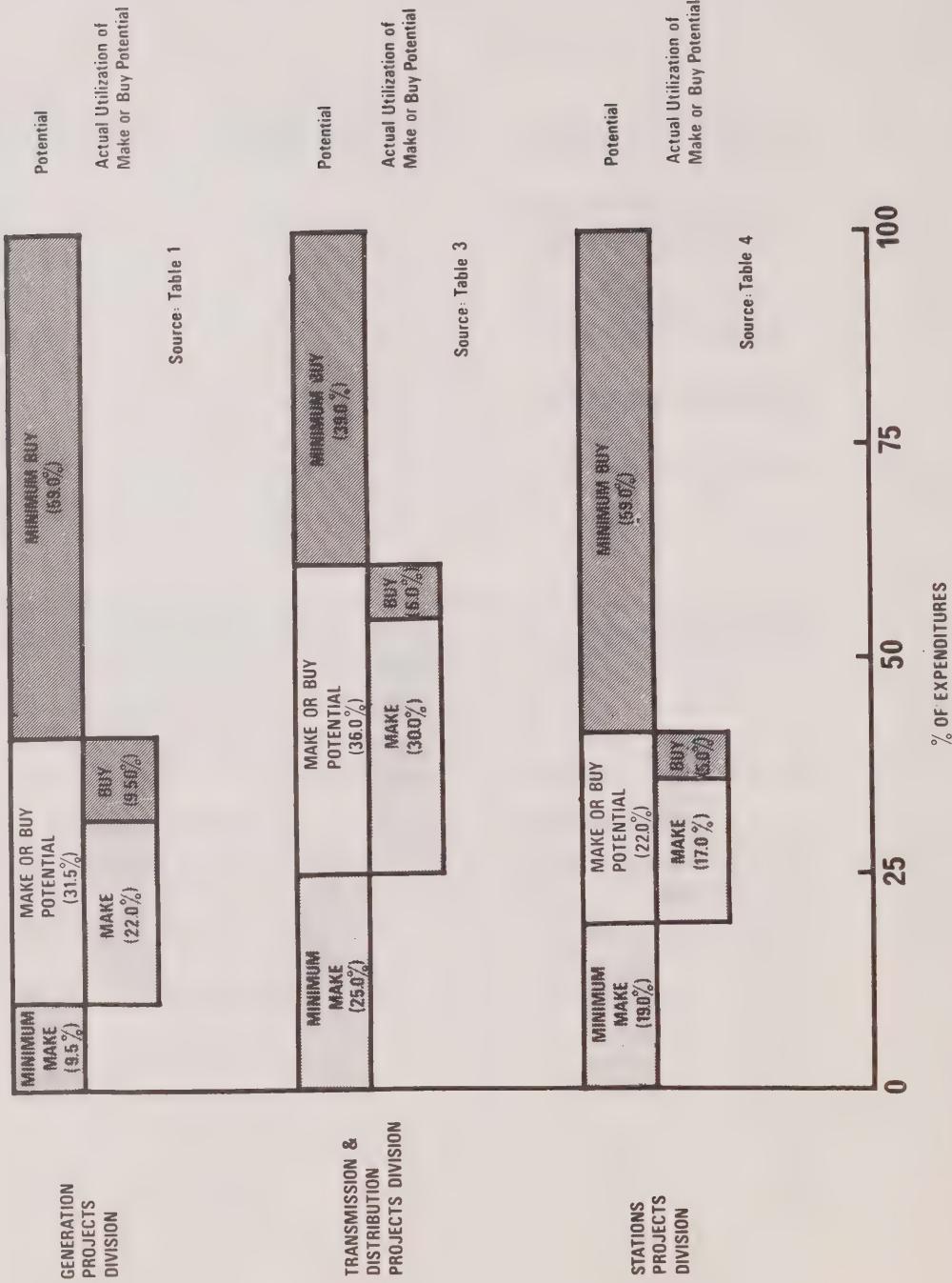
**TABLE 8: COMPUTER FUNCTION
ANALYSIS OF 'BUY' EXPENDITURES
1964-1971**

Nature of Expenditure	Amount in \$ millions	Percentage of Total
Time purchased on external computing facilities	2.4	42
Communications service, mainly Bell Canada	1.3	23
External programming	1.2	21
Maintenance	0.6	11
Other	0.2	3
Total Expenditure	5.7	100

Realization of 'Make or Buy' Potential

Figure 3 illustrates in summary the degree to which the Design and Construction Divisions are achieving potential levels of 'Buy'. Comparative data for the Computer Function and Maintenance Services cannot be presented on the basis of our analysis but there is little doubt that similar scope for increased 'Buy' exists in these areas. Of the 75 percent estimated 'Make or Buy' potential for the Computer Function approximately 72 percent was 'Make'.

FIGURE 3: REALIZATION OF MAKE OR BUY POTENTIAL



SECTION III

TOWARD A 'MAKE OR BUY' STANCE

The Need for Change

Hydro today, like utilities throughout the world, faces a broader range of issues, social and economic as well as technical. To cope with such a dynamic situation, more effective decision-making mechanisms will be essential, both in Government and in Hydro. For its part, Hydro must be able to formulate new corporate policies in response to changing requirements. We have dealt with Hydro's future role in Report Number One and in Report Number Two⁴ we discussed 'Policy Responsiveness' as one of the criteria upon which Hydro should base its Approach to Organization. Hydro's 'Make or Buy' stance can enhance its ability to fulfill this broader mandate by strengthening relations between the Corporation and the private sector. It was with this in mind that in Report Number One we recommended that:

- 1.4 Hydro exploit its technology through developing and pursuing policies to share its technological expertise with the private sector.

There are also potential benefits for Hydro in terms of improved productivity and efficiency.

Exploitation of Technology

The wealth of technical and managerial expertise possessed by Hydro is, in part at least, a result of a general propensity to 'Make', and the experience born of building and operating one of the largest electric utility systems in North America. The major theme of this study is the proposition that, were Hydro to place more emphasis on 'Buy' the private sector would benefit from this accumulated expertise, and that there will be benefits for Hydro itself as it works more closely with those in a competitive environment. The benefits of more 'Buy' should be mutual.

As a prime example, Hydro's engineering and construction skills utilized in fossil-fired or nuclear generation projects represent a potential which could be exploited by the private sector in export or domestic markets. There are precedents which confirm the practicality of such a process, for it was technical expertise originating in Ontario Hydro upon which one of Canada's largest engineering companies gained a world-wide reputation in the hydro-electric generation field. The time now seems ripe for Hydro to assist Canadian engineering and construction firms to build a similar reputation in the fossil-fired and nuclear generation field. Similar opportunities may also exist for Hydro to extend assistance to those in the private sector working in computer technology.

Control of Organizational Growth and Evaluation of Performance

All organizations have to face fluctuating work loads and changing work programmes which cause variations in the numbers of people who can be usefully employed. In an expanding organization, the work load increases and the work force grows. In organizations with 'Make' biases, the growth in staff levels is roughly proportional to the increase in work load, perhaps less if economies of scale can be achieved. An organization with a 'Buy' bias, on the other hand, should need a smaller increase in staff relative to a similar increase in work load.

The forecast growth in demand for electricity of 7 percent per annum implies a significant growth in the Hydro organization, illustrated by manpower projections prepared by the Design and Construction Divisions. These indicate the following growth in manpower requirements, assuming continuation of current Hydro policy:

		1972	1980	% Increase
Engineering	— by Hydro	2,100	2,700	28
	by Others	600	1,100	83
Construction	— by Hydro	5,700	11,700	105
	by Others	2,000	4,100	105

In the interests of efficiency, Hydro must be able to respond effectively to changing work patterns and fluctuating work loads, particularly on the down turn. Greater emphasis on 'Buy' in future would allow Hydro to gain a measure of such flexibility through controlled growth of its staff.

Where a choice exists between internal and external resources Hydro managers have a basis for gauging the performance of internal resources, relative to those in the private sector. Despite the difficulties inherent in such comparisons, a 'Make or Buy' stance permits Hydro to compare the performance of its internal groups with that of corresponding groups outside. When Hydro awards contracts for certain types of design and construction work, comparative data become available on costs and effectiveness. These data are invaluable in establishing the basis for an efficient costing system which must go hand-in-hand with a 'Make or Buy' capability.

Under the Service "Market" concept outlined in Report Number Two, Hydro's Support Services would be required to recover their costs through charges to user groups or "customers". The market would encourage efforts by the providers of service to adapt their methods to the needs of their "customers" in terms of quantity, quality, delivery, price and reliability. It would also allow the "customer" to buy service outside if he could secure better terms. A well developed 'Make or Buy' stance would enhance

Hydro's ability to establish the concept of a Service "Market" as a means of furthering the productivity and efficiency of the corporation.

On the basis of the foregoing we conclude that Hydro should 'Buy' more and 'Make' less and that, provided increased levels of 'Buy' are introduced within carefully prescribed limits, all concerned will benefit. We therefore recommend that:

- 5.1 *Hydro develop an explicit 'Make or Buy' policy which will accelerate the transfer of its technology to the private sector and encourage greater productivity and efficiency in its operations.*

Supplier Development

At present, alternative suppliers do not exist to provide the range of products facilities and services necessary for a 'Make or Buy' stance for Hydro. Only a single Canadian company currently can provide the complete experience and resources necessary for the design of a large scale fossil-fired generating station. Hydro and Atomic Energy of Canada Limited (AECL) together constitute the only existing resource fully experienced in designing a large-scale CANDU Pressurized Heavy Water nuclear station. The problem is generally similar in the construction area, particularly when considering the employment of contractors for major segments of fossil-fired and nuclear plants. For the Computer Function, 'Buy' has been hindered until recently by the relatively small number of external data centres with the level of experience necessary to meet Hydro's processing needs. Many of Hydro's current activities are on a very large scale, and involve a high level of technical and management sophistication. This makes increased 'Buy' difficult in the short-run. Lack of expertise in the private sector poses severe problems for Hydro in the development of a 'Make or Buy' stance – problems which will require considerable effort to overcome.

Whenever practical, multiple sources of supply should be nurtured to guard against the possibility of Hydro finding itself the 'captive' of a single external supplier, and also to gain the advantages of competition. It is here that problems will arise. For heavy equipment, the capital-intensive nature of the industry and Hydro's relatively limited demand will severely restrict the number of firms that can be dealt with. The scale, complexity and critical importance of major construction projects makes guaranteed performance a prime necessity and, for reasons of system security, Hydro will be able to deal with only a few engineering and construction companies. The vital questions are, which firms are to be selected, and how many? Answers will not come easily, especially in the major construction field where Hydro's 'Buy' experience is limited.

Careful planning will be needed and it will be especially important to enlist the support of government and the understanding of suppliers in the private sector. A set of criteria should be established by Hydro to determine how many alternative sources should be developed and to describe the basis for selecting these sources. In certain cases where major construction or equipment is involved, Hydro will have to negotiate contracts rather than award them on the basis of open competitive tenders. This may well lead to accusations of restricting competition and of failing to obtain the lowest possible price. What is needed is a clear and well publicized statement of Hydro's supplier development programmes to gain public support by explaining the problems and potential benefits.

There will be opportunities for firms of all sizes as long as they have technical skill and competent management. For generation projects Hydro will choose from amongst the larger firms, but for transmission and station projects small firms will be able to compete. Several courses of action are open to Hydro in assisting firms in the private sector that have been selected as potential suppliers:

- Work with the Ministry of Industry and Tourism and the Ontario Development Corporation to develop assistance programmes for prospective suppliers;
- Assist firms in the private sector to secure financial aid through existing Federal Government programmes;
- Seek the cooperation of Government at the provincial and federal level for additional support programmes;
- Enter into joint ventures with selected firms with the object of enhancing the ability of the private sector to supply goods and services; and
- Provide long-term commitments to suppliers in cases where large capital investment or critical resources are involved.

Hydro should endeavour to develop resources and services wherever they can be made available with adequate quality and at competitive prices in the long run. This will require judgement since propositions which do not look attractive in the short run may become so once the suppliers have acquired a knowledge and appreciation of Hydro's special needs and requirements.

We therefore recommend that:

5.2 Hydro promote the development of specialized managerial and technical expertise within selected firms in the private sector to assure itself 'Make or Buy' alternatives for the supply of key goods, facilities and services.

In many activities Hydro must continue to 'Make', or retain the capability to 'Make'. These will be identified by Hydro to preserve the ability to meet its primary mandate as well as to provide genuine 'Make or Buy' options. This is discussed in detail in Section IV, as it deals with Design and Construction. The development of internal resources as well as resources in the private sector will be an integral part of Hydro's approach to a 'Make or Buy' stance.

'Make or Buy' Decision-Making

The role of the Vice-President – Corporate Planning, as outlined in Report Number Two, is to bring together the technical, social and political implications of strategy and policy alternatives available to the Corporation. Since his office is to have a minimum staff, most of the necessary analysis will be performed by personnel from the operating *Divisions*⁵ of Hydro, from Government or the distribution utilities. He should ensure that planning and analysis are carried out to integrate strategic and operational plans.

The Corporate Vice-President's responsibility in supplier development will be limited to identifying in broad terms Hydro's future needs for resources, relying heavily on analysis performed by *Divisional* personnel or others from Government and the utilities. What are the alternatives? Which areas should be met by external resources and which by internal? How do considerations stemming from Hydro's broader role influence these alternatives? Once such questions as these have been answered, the job of supplier development becomes the responsibility of the line organization with Hydro Support Services Division playing a key role; such development is not a responsibility of Corporate Planning.

The philosophy underlying a 'Make or Buy' stance for Hydro is embodied in the policy of the Provincial Government which, as we have recommended, should direct the Corporation to share its technological expertise with the private sector. In formulating its corporate policy for 'Make or Buy' Hydro will have to determine:

- Considering other corporate objectives, in which general areas requirements should be met through external resources; and
- What levels of 'Make' are required to ensure system security and reliability, cost effectiveness and the maintenance of Hydro's technical leadership.

We envisage these questions being resolved by the Hydro Board on the advice of the Corporate Office, which, as we have discussed in Report Number Two, will play a key role in the establishment of Hydro's corporate policy. The Corporate Office is also responsible for translating the 'Make or

Buy' corporate policy into clearly defined *Divisional* objectives to facilitate 'Make or Buy' decisions.

'Make or Buy' procedures must allow for the resolution of conflicting objectives, those of the Corporation, of user groups and of service groups. The manager of a user group bases his priorities on group deadlines and on his costs in the short-run and over the long-run; he is concerned with reliability, he seeks to retain flexibility and a maximum degree of control over his operations; he wants specialized support on short notice. In a 'Make or Buy' context, user interests will inevitably conflict with those of a particular service group where the manager has his own deadlines to meet. The latter is concerned with reasonable work load and a steady demand for his services in order to attract and retain good people; he is concerned also about economic operation with full recovery of costs and being supported by adequate resources. And finally, in some cases the objectives of both the user and the internal service group may be at variance with corporate policy. It is clear then, that guidelines must be established to resolve conflict in the best interest of the Corporation as a whole. Personnel and financial policies must be defined, as well as the division of responsibility and authority for 'Make or Buy' decisions.

We therefore recommend that:

5.3 Procedures be established to define the terms and conditions governing the use of internal and external resources and the division of responsibility and authority of Hydro managers for 'Make or Buy' decisions.

Generally speaking, once a specific need has been identified, the first step will be to carry out a cost/benefit analysis to determine alternative means by which the need can be fulfilled, and the most economical source of supply. In a 'Make or Buy' context the principal question underlying the analysis of alternative sources of supply will be a comparison of internal versus external resources. Normally, if an external supplier offers the better proposal based on such criteria as cost, quality, reliability and delivery, there would be a decision to 'Buy'. On the other hand, a 'Make' decision would follow if an internal resource proved superior in terms of the same criteria.

All decisions will be subject to corporate policy, which may dictate a decision other than that which would be justified by the cost/benefit analysis alone. A 'Make' decision for example, may be required on grounds of system security, or a 'Buy' decision in order to develop an external resource.

In Report Number Two we suggested a number of criteria to guide Hydro in its approach to organization for the future. All of these are relevant to the implementation of 'Make or Buy' policy but perhaps the most

important is "manageability". In the report we pointed to "A current shift in management thinking ... which favours organization components within which individuals can grasp a set of objectives and performance standards. This will enhance individual motivation, ensure greater responsiveness to the task...". This suggests a general decentralization of responsibility within Hydro.

We recommend that:

5.4 Maximum authority for cost/benefit analysis and 'Make' or 'Buy' decisions be vested in the managers of user groups.

Organization for 'Make or Buy'

A second criterion with special significance for Hydro's 'Make or Buy' stance is the "differentiation" of the components of the organization. Each should be structured and managed to fulfill its particular role. This suggests that Hydro's service groups be allowed the degree of freedom necessary to compete with corresponding resources in the private sector. As pointed out in Report Number Two, part of Hydro's strength in the past has stemmed from its tightly integrated approach to organization. The development of a 'Make or Buy' capability will require a greater degree of differentiation.

We therefore recommend that:

5.5 Hydro service groups be allowed discretion in adopting organizational structures and management techniques to compete effectively with external suppliers for Hydro work.

Continuity of Employment

Hydro's policy is to provide continuity of employment, resorting where necessary to internal transfers and retraining. Levels of employment in personnel and supervisory staff in the construction trades is adjusted by Hydro to meet the demands of the construction programme. This flexibility in the construction area allows 'Buy' decisions to be reached more easily than in areas where the staff consists largely of regular employees. This is not to say, however, that Hydro has not exhibited a capability to reduce its regular staff levels when the need arises. Between 1958-1962, the Design Staff was reduced by 20%, largely by a process of attrition.

In the interest of staff morale, Hydro's approach to a 'Make or Buy' stance must take into account the short- and the long-run effect of 'Buy' decisions on employment levels. With proper planning, there is no reason why increased levels of 'Buy' cannot be phased so that the effects on staff requirements are offset through normal attrition and system growth.

Nevertheless, occasionally an internal programme may have to be cut back because users opt to 'Buy'. In such cases Hydro must be prepared to transfer people, and where internal relocation is not feasible, to arrange transfers to other organizations on a temporary or permanent basis. Before release is resorted to, there should be a Hydro-wide search for a new position which could be filled by the individual with retraining. When in the final analysis, release is inevitable, equitable severance benefits must be provided and full assistance for relocation.

Proper emphasis on retraining will assure a wide range of technical and managerial opportunities for displaced personnel, and if the procedures suggested above were fully developed, much of the apprehension associated with a greater emphasis on 'Buy' could be alleviated.

It should be emphasized that we are not recommending reductions in the Hydro organization, despite our advocacy of higher levels of 'Buy' in Hydro's future. What we do suggest is slower, more closely controlled growth rates and more efficient, more effective utilization of Hydro manpower, in order to provide the degree of flexibility necessary for Hydro managers to make 'Buy' decisions whenever these appear desirable. It is important to stress that change must be coordinated from a corporate standpoint so that Hydro's ability to meet its primary mandate is not jeopardized. If disruption is to be minimized, change should be gradual. Change must be "managed", especially from a personnel point of view.

Accordingly, we recommend that:

- 5.6 (a) Hydro utilize to the fullest possible extent system growth and normal attrition to offset reduced staff requirements resulting from increased levels of 'Buy'.*
- (b) Those displaced be transferred internally with retraining where necessary or, as a last resort, be provided with full assistance in relocation.*

Costing of Internal Services

From the standpoint of productivity and efficiency alone, Hydro should be able to compare its costs with those in the private sector. This is essential for a 'Make or Buy' stance. To ensure that Hydro users have access to a market composed of internal and external resources competing on a comparable footing, internal service groups must base their charges on the full cost of providing service, including personnel and equipment costs, overhead, rent, depreciation, fringe benefits, and the like. If the cost of service groups is merely reflected in the general overhead, then from the user's viewpoint, it is indeed cheaper to use internal resources.

The 'Make or Buy' Study Team noted that a number of groups in Hydro, the Design and Construction Divisions for example, included overheads in costing capital projects for comparison of Hydro's costs with those in the private sector. We have no reason to believe that all groups do not follow a similar practice, but we have noted a lack of consistency in procedure throughout the organization. We suggest a thorough review to resolve anomalies and inconsistencies. That some service groups are not recovering as high a percentage of their costs as possible is illustrated by Table 9 which shows that the Computer Function, in 1971, recovered only 43 percent of its total expenditures.

We therefore recommend that:

5.7 All Hydro service groups charge internal user groups on a basis which recovers the full and true cost of the services rendered, established in accordance with generally accepted accounting principles and practices.

**TABLE 9: COMPUTER FUNCTION
RECOVERED AND UNRECOVERED EXPENDITURES
1971**

RECOVERED EXPENDITURES	Amount in \$ millions	Percentage of Total
Engineering Branch	4.7	34
Services Branch	0.5	3
Finance Branch	0.5	3
Others	0.4	3
Total Recovered	6.1	43
 UNRECOVERED EXPENDITURES		
Corporate Systems	3.2	23
Input Collection, Validation and Data Error Handling	2.6	19
Management Services	1.0	7
Planning and Overhead	1.1	8
Total Unrecovered	7.9	57
TOTAL EXPENDITURES FOR 1971	14.0	100

Tendering Practices

Hydro has traditionally followed a 'closed' information policy in awarding contracts for goods and services. In the case of construction services the current practice is as follows:

- To withhold a bidder's price from all the other bidders; and
- To disclose to the other bidders only, the name of the successful bidder and the reason for awarding the contract.

Such limited disclosure has been the subject of criticism in the briefs to Task Force Hydro, and we feel that, as a public body, Hydro should reveal the basic bid prices to those firms which have submitted proposals, especially when these have been received in response to publicly advertised tenders.

Hydro defends its tendering policy relating to Design and Construction contracts, for example, by pointing out that work is awarded on the basis of 'lowest evaluated cost' which takes into account, in addition to the bid price, the contractor's experience and ability to complete the job in accordance with the specifications and within the time allotted. Subjective judgements are necessary which Hydro feels may be easier to arrive at with limited disclosure.

Where proposals for major equipment are being compared, many more factors such as maintenance cost, performance, reliability and durability are taken into account in arriving at "lowest evaluated cost". Much equipment is highly sophisticated and often based on new technology. These factors complicate the comparison of proposals and Hydro tends to rely on invited tenders and negotiated contracts. In these circumstances disclosure is not really practical, nor does it appear to be a matter of major concern to suppliers.

Task Force Hydro agrees that Hydro must have discretion to award contracts on the basis of 'lowest evaluated cost' but feels that Hydro would do well to move, where possible, to a more open information policy. Appendix I describes a relevant proposal developed by the 'Make or Buy' Study Team for a revised procurement policy for construction services. All bidders would be informed of the total base prices submitted and the rationale for the contract award. The benefits arising were seen to include:

- Improved relationships with the construction industry;
- Reduced tendering costs; and
- Development of construction capability in the private sector.

Although the procedure proposed was intended by Hydro to apply only to design and construction services, it has broader implications which

could include services of almost any kind. We would encourage Hydro to reveal more information to bidders generally, including those who seek contractors to supply goods, equipment or services.

We therefore recommend that:

5.8 Hydro adopt generally a more open information policy for all forms of tendering especially where competitive bids for the supply of goods and services have been received in response to public advertisement.

We recognize that it sometimes proves economical for Hydro to award contracts on the basis of cost plus a percentage for overhead and profit, or cost plus a fixed fee. In such cases Hydro can protect its interest through incentive and penalty arrangements and/or agreed-to upset limits.

Purchasing Policy

Task Force Hydro favours the principle that Hydro should buy from Canadian rather than foreign firms since this supports the process of technology transfer and the development of broader, more sophisticated markets for our industry. A number of jurisdictions, notably Quebec and British Columbia, have gone further by adopting policies reflecting preferences for suppliers located within their own boundaries. We recognize that, in broad terms, the restriction of interprovincial trade is a topic which may lie outside our terms of reference. However, it is a topic of significance to Hydro for there are potentially undesirable effects on the cost of power and, furthermore, the matter has been the subject of a number of briefs to Task Force Hydro.

While economic principles frown on artificial trade barriers, there are often cogent reasons for them in the international sphere. Within one country, however, such measures serve only to encourage divisiveness and mitigate against the national interest. Economic inefficiency or misallocation of resources results, and the Canadian economic philosophy of free competitive trade among provinces is threatened.

If one excludes fuel purchases, Canada was the point of manufacture for some 80 percent, in dollar value, of Hydro's purchases during the years 1970 to 1972, and Ontario was the point of manufacture of almost 90 percent of those purchases within Canada. This would suggest that there is no need for artificial provincial trade barriers as far as Ontario Hydro purchases are concerned. Indeed, if such barriers were established in the form of a predetermined margin between Ontario and other bidders, there is a strong probability that Hydro would simply be paying this margin as a penalty.

A number of briefs submitted to us by contractors and engineers favoured a "Canada first" policy but indicated no support for discrimination on a provincial basis. We agree with this view and urge that every effort be made to reverse the disturbing trend toward interprovincial trade restrictions before any serious consideration is directed towards the adoption of similar practices by Ontario.

We recommend that:

5.9 The Government confer with other Provinces and the Federal Government to seek the elimination of interprovincial trade restrictions.

FOOTNOTES

- ⁴. Task Force Hydro, Hydro in Ontario – An Approach to Organization, Report Number Two, December 14, 1972.
- ⁵. *Divisions* is used in the sense of the new mission-oriented *Divisions* proposed for Hydro in Report Number Two.

SECTION IV

POLICIES FOR 'MAKE OR BUY'

In this section a number of recommendations are put forward dealing with specific areas of Hydro operations in which 'Make or Buy' decisions are particularly important. The recommendations have been derived from the working papers of the Study Team which dealt with Design and Construction, Maintenance, and Computer Function activities in detail. These papers contain many more recommendations than are dealt with here; they have been submitted to Hydro for consideration and future action.

Design and Construction

Design and Construction is responsible for the provision of generation, transmission and distribution facilities at the lowest cost compatible with the broad standards of reliability agreed upon by Hydro and the Government and with due regard for the environment. This responsibility is expressed in Recommendation 1.3 (b) in Report Number One. As implied in that Report, Hydro's role as a public utility and delivery agency of Government requires that the involvement of the private sector in the provision of these facilities be given special attention. With respect to design and construction there is need for a close and continuing relationship between those who plan the system, those who design and construct the facilities, and those who finally operate them. The feedback inherent in such communications serves to improve the result, and is essential to the process of producing the specifications necessary to allow firms in the private sector to tender on Hydro's requirements. Without such specifications, Hydro's requirements could not be defined, nor could the private sector become involved. Hydro's traditional ability to advance the 'state of the art' must be maintained in order to ensure a continuing flow of technology which can be shared with others. For this to happen, Hydro must retain a high level of design and construction capability.

In this context, it remains to identify the 'Make' activities and the extent to which 'Buy' can be increased for Hydro's design and construction programme. In the judgement of the Study Team, it is feasible for Hydro to provide a sufficient volume of work to the private sector on a continuing basis to permit outside organizations to undertake, within 5 years, the design and construction of selected facilities for lines and stations projects and, within 10 to 15 years, for fossil and nuclear stations. The Study Team proposal for the achievement of this objective is described in more detail in Appendix II.

We recommend that:

5.10 Hydro seek increasingly to 'Buy' design and construction services with a view to awarding contracts:

- (a) For the complete detailed design and construction of selected stations Projects within 5 years;*
- (b) For the construction of selected transmission line projects within 5 years; and*
- (c) For the detailed design and construction of selected nuclear or fossil-fired generation stations within 10 to 15 years.*

We have already discussed in the preceding section the necessity for Hydro to develop criteria to serve as a basis for the selection of those firms with the clear potential to take full advantage of the special expertise they will gain. Only with a 'prequalification' system will this recommendation be achievable.

As pointed out in Section II, it has been Hydro's policy to delay the initiation of work programmes to the last possible moment. This recommendation implies an advancement of commitment and earlier engineering which may involve extra interest costs to carry the work for a longer period. Further, since the design may be executed under conditions of less certainty, additional costs may arise from last minute modifications to construction plans or revisions in the fabrication of major equipment. We believe that if these costs do occur they will be minor in relation to the long-term benefits associated with increased 'Buy'.

Construction Labour Relations

The completion of a major construction programme, within budget and on schedule depends, to a significant degree, on union-management agreements and harmonious labour relations. Hydro has had considerable success in this respect by sharing responsibility with contractors.

Hydro and its construction contractors are currently working through the Electrical Power Systems Construction Association (EPSCA) to negotiate a multi-employer, multi-union, province-wide labour agreement with a committee representing the building trade unions. Such an agreement is not without precedent. Hydro has worked with a council of craft unions since shortly after World War II and the St. Lawrence River Power Project was constructed under an agreement negotiated between an employers' association, comprising up to 144 contractors, and a Council of Unions covering all the work on the project.

Such multi-party province-wide agreements are especially important to Hydro owing to the unique character of its major construction projects. A generating station project can take up to 10 years to complete and employ tradesmen represented by as many as 11 international unions. A transmission line project is complicated by the fact that it can be located in several accreditation regions.

Project Management and Programme Management

Hydro's generating stations are designed and constructed on a project management basis, the responsibility being divided between a Manager of Engineering and a Manager of Construction, each of whom reports to the Director of the Generation Projects Division. The latter, in effect, acts as the Project Manager for all generation projects.

The Study Team has recommended that the concept of project management be extended to the point where maximum authority for a single large project would be vested in a Project Manager responsible for all aspects of the project from the design stage to its completion. For smaller projects, where a number of these could conveniently be integrated into a single programme, a Programme Manager would be appointed with responsibilities corresponding to those of the Project Manager.

Project Teams are now formed for major projects with personnel transferred from various functional groups. While with the team, members devote their entire effort to the fulfillment of the project. Assistance not available within Hydro is obtained from external resources. Programme Teams would be constituted in a similar manner but would include fewer transferred staff.

In our view the appointment of Managers with authority extending to all aspects of the work would greatly enhance 'Make or Buy' capability in the capital construction area. Such a procedure also supports the criterion of "manageability" discussed in Section III.

We are in favour of strengthening the Project and Programme Management concept and we recommend that:

5.11 Authority for 'Make or Buy' decisions be vested in Project Managers appointed for major generation projects and Programme Managers appointed for integrated groups of smaller capital projects.

Maintenance

Our analysis has indicated a number of areas in which there is an immediate potential for increased use of external maintenance resources.

These include:

- Forestry clearing and spraying;
- Helicopter services; and
- Janitorial and related building services.

Studies now completed by Hydro indicate substantial 'Buy' potential in heavy mechanical maintenance and the design of a Central Maintenance Shop is proceeding on this basis.

We recommend that:

5.12 (a) Hydro increase its use of external maintenance resources in such areas as forestry, clearing and spraying, helicopter service and janitorial and building services.

(b) Hydro support the development of external facilities in addition to its own Central Maintenance Shop to ensure a 'Make or Buy' capability for the repair of major equipment.

Computer Function

Although the Computer Function does not carry out a formal audit role, it offers users advice on technical matters. In the past, owing to the rapidly advancing 'state of the art', users may have tended to rely heavily on this advice, but as they gain experience they should become more independent in arriving at 'Make or Buy' decisions. Such independence is most important for there are often fundamental questions concerning the relative merits of a computer versus a manual system in a given application.

The Computer Function will have an increasingly important role in assisting with the preparation of system specifications to assist users in obtaining alternative proposals on which to base a 'Make or Buy' decision. Under the organization structure proposed in Report Number Two the user might approach the Systems and Management Services group for such advice. Both this group and the Hydro Data Centre were seen by the Organization Study Team as part of the Hydro Support Services Division and as elements of the proposed Service "Market". We see the function of this "Market" not only to assist the user in arriving at a 'Make or Buy' decision, but also to assist in determining the most appropriate means of fulfilling the need. If the "Market" is to operate effectively it is essential that the Hydro user assume responsibility for his own 'Make or Buy' analysis.

· We recommend that:

5.13 Users of Computer services become more skilled in defining their system requirements and be given responsibility for 'Make or Buy' decisions subject to corporate guidelines.

And we further recommend that:

5.14 The role of the Computer Function to provide technical advice to Hydro users be clearly differentiated from its role to provide computer services.

Hydro is heavily committed to large integrated systems serving many users and supported by large central computers. There is a need to review these systems to identify elements which could be converted to single-user systems, thereby achieving greater flexibility and reducing the degree to which users are "locked in" to the system. There will be areas where centralized multi-user systems will continue to be used on economic grounds.

We recommend that:

5.15 Hydro adopt specialized single-user computer systems for use in areas with positive 'Make or Buy' potential.

Transfer of Hydro Management Expertise

Hydro is, from time to time, called upon to make its expertise available abroad. In fulfilling these requests, Hydro stands to reap a number of benefits. A broader range of professional development opportunities is opened up to Hydro personnel. There is the further advantage that these activities increase awareness abroad of Canadian skills, which can generate export work for firms in the private sector.

Canadian National has established an international consulting division, known as CANAC to make available its specialized expertise. CANAC performs most of its work abroad, offering its services domestically only when similar services are not available from the Canadian private sector. We understand that CANAC's operations have been successful and suggest that Hydro consider a similar approach, providing Hydro's ability to transfer its technology to the private sector is not impaired, and that precautions are taken to avoid competing unfairly with the private sector.

As long as the services involved are not being offered by Canadian firms in the private sector and as long as standard professional fees, including overhead and profit, are charged there should be no question of unfair

competition. With these provisos, we would favour a Hydro version of CANAC, not only for the reasons given but also because such an organization would offer an excellent vehicle for joint ventures, through which Hydro could impart its technical expertise to a partner. By these means Hydro could assist in developing resources vital to the future supply of electrical energy in Ontario, as well as improved technical capability in the private sector.

We therefore recommend that:

5.16 Hydro establish a group through which to make available its specialized management and technical skill on a fee-for-service basis except in those areas that would compete directly with suppliers in the Canadian private sector.

SECTION V

SUMMARY OF RECOMMENDATIONS

REPORT NUMBER ONE: HYDRO IN ONTARIO A FUTURE ROLE AND PLACE

Task Force Hydro recommended that:

HYDRO'S ROLE

- 1.1 (a) *Ontario Hydro be responsible to the Government of Ontario for the generation, transmission and distribution of electric energy in the Province.*
- (b) *Ontario Hydro discharge this responsibility in compliance with the overall policy of the Provincial Government.*
- (c) *Except where economic considerations dictate otherwise Ontario Hydro delegate its responsibility for the distribution of electric energy to utilities that are agents of municipalities.*
- 1.2 *Hydro be a delivery agency of the Provincial Government receiving broad policy direction from the Government through the Provincial Secretary for Resources Development.*
- 1.3 *Hydro be directed through the Provincial Secretary for Resources Development:*
 - (a) *To meet demand for electricity in Ontario at the lowest feasible cost.*
 - (b) *To maintain those standards of reliability which are agreed upon from time to time by the Government and Hydro.*
- 1.4 *Hydro exploit its technology through developing and pursuing policies to share its technological expertise with the private sector.*
- 1.5 *As a general rule, the additional costs incurred for environmental concerns be included in electricity prices.*

- 1.6 *Hydro actively participate in the development and support of Government policies with respect to energy and the environment.*
- 1.7 *Hydro's marketing policy be designed specifically to support Provincial energy and environmental policy and, within the limits thereby imposed, to ensure the most efficient use of the system's capital facilities.*
- 1.8 *There continue to be close coordination between Hydro and the Ministry of Treasury, Economics and Intergovernmental Affairs in financial matters.*
- 1.9 *In the event that Hydro should be required to support regional development or contra-cyclical construction policies, the additional costs of so doing should not be built into power prices but should be borne by subsidy from the Provincial Treasury.*

HYDRO AND THE PUBLIC

- 1.10 *Hydro establish a procedure whereby representations and appeals from the public can be heard by a body responsible to the senior policy making body of Hydro but not a part of the line organization.*
- 1.11 *There be no requirements for the consent of the Minister of Justice and Attorney General to bring an action against the Hydro Commission or any member of the Hydro Commission.*
- 1.12 *Hydro consider the establishment of ad hoc citizen's task forces to provide for citizen participation in the locating of generating and transmission facilities and in other matters of concern to the public.*
- 1.13 *Responsibility for the establishment of electrical safety standards be transferred to an agency of the Ontario Government other than Ontario Hydro, but responsibility for the actual inspection function continue to rest with Hydro.*

HYDRO AND THE PROVINCIAL GOVERNMENT

1.14 *Government policy, defining the broad objectives and constraints within which Hydro must operate, be specified by the Lieutenant-Governor in Council.*

1.15 *To give expression to Government policy for Hydro and to define Hydro's mandate, a contract be drawn up between the Provincial Government and Hydro.*

1.16 *Government policy for Hydro that is not defined by Orders-in-Council or by the Government-Hydro contract be determined by the Provincial Secretary for Resources Development in consultation with the senior policy body of Hydro.*

1.17 *Hydro be directed to pursue other objectives which may be established from time to time by the Lieutenant-Governor in Council.*

CORPORATE STRUCTURE

1.18 *Ontario Hydro be designated as a Crown Corporation to be known as the Hydro Corporation of Ontario or Ontario Hydro.*

1.19 *The Board of the Hydro Corporation be empowered to deal with the Government on behalf of the total delivery system so as to facilitate consistent policy direction for the total system.*

1.20 *The Hydro Corporation Board consist of eleven members appointed by the Lieutenant-Governor in Council as follows:*

- *a Chairman, for a five year term, renewable*
- *the President of the Hydro Corporation, ex officio*
- *two representatives from nominations submitted by the Board of Directors of the Ontario Municipal Electric Association, for three year terms, twice renewable.*
- *two senior civil servants*
- *five members-at-large to be named from outside the*

delivery system and government and to be selected for expertise in industrial, corporate, economic or other matters relevant to Hydro, appointed for three year terms, twice renewable.

- 1.21 *The Chairman be appointed on a full time basis and his orientation be outward to the Ontario community and to the Government and that, with his Board, he focus on the translation of Government policy into consistent and achievable corporate objectives and policies.*
- 1.22 *The President be responsible to the Board of Directors for directing the affairs of the Corporation in accordance with goals and objectives established by the Board.*

HYDRO AND THE UTILITIES

- 1.23 *Ontario Hydro be directly responsible for the management of that part of the delivery system which generates and transmits bulk power.*
- 1.24 *The division of responsibility between the wholesale and retail functions be drawn at the main secondary bus-bar of the transformer station.*
- 1.25 *Municipal utilities be rationalized into upper tier regional utilities where and as new municipal government is implemented.*
- 1.26 *The area to be served by the regional utility be the entire area served by the municipal government.*
- 1.27 *A first step toward rationalization encompass those areas of the Province that now have new municipal governments, with the experience thus gained to guide future steps.*
- 1.28 *Those responsible for planning the rationalization of the retail system attempt to achieve some rationalization of utilities which do not lie within areas soon to be under the jurisdiction of new municipal governments, including the private utilities.*

1.29 *The commissioners of regional utilities be appointed by the municipal council from outside the council with the exception of the chairman of the council who shall be a member ex officio of the commission.*

1.30 *The Hydro Corporation give effect to its policy and that of the Provincial Government through contracts with each utility, such contracts to reflect a working agreement between the Corporation and the utility.*

OWNERSHIP

1.31 *Control and ownership of the Hydro Corporation continue to reside with the Government of Ontario, but the interest of the municipalities be established and defined as follows:*

(a) *An equity account be established on the balance sheet of the Hydro Corporation as an item to replace the "equities accumulated through debt retirement charges" and certificates be issued to the participating municipalities and to the Corporation as trustee for the power district for their proportionate shares therein.*

(b) *The certificates be described as non-voting participating shares in the equity account of the Hydro Corporation (equity account shares) and new certificates be issued annually to represent the changing interests of each participating municipality and the rural power district in the same manner as the debt retirement charges have been apportioned annually in the past.*

(c) *The certificates entitle each participant holding such certificates to receive on the liquidation or winding up of the Hydro Corporation a share proportionate to the dollar amount of the certificates held of the surplus funds realized on liquidation after payment or provision for payment of all debts and obligations of the Hydro Corporation.*

ORGANIZATION

1.32 *Once the Government has established a redefined mandate for Hydro the senior governing body of Hydro require management to submit for its approval a detailed plan and timetable for an approach to organization.*

REPORT NUMBER TWO: HYDRO IN ONTARIO – AN APPROACH TO ORGANIZATION

Task Force Hydro recommended that:

INTERIM ORGANIZATION

- 2.1 *The organization concepts developed by Task Force Hydro's Organization Study Team be adopted by Hydro as an approach to organization in fulfillment of the new role and place as approved by the Government of Ontario.*
- 2.2 *As an initial step toward a new organization, Hydro establish a Corporate Office and a Divisional structure based on the four missions identified by the Organization Study Team; viz; Design and Construction, Generation and Transmission, Distribution, and Supply Services.*

APPROACH TO A NEW ORGANIZATION

- 2.3 *Hydro initiate further studies, using external resources where necessary, to plan the organization structure best suited to its new Role and Place and to develop the highest possible level of productivity and efficiency.*

PUBLIC RESPONSIVENESS

- 2.4 *Hydro establish an Office of Public Affairs headed by the Director of Public Affairs responsible to the Board for hearing grievances relating to services to the public rendered by Hydro and the distribution utilities.*
- 2.5 *The Director of Public Affairs place himself at the disposal of members of the Legislature to ensure rapid and effective response to questions and complaints submitted by constituents about Hydro or the distribution utilities.*
- 2.6 *Ontario Hydro planners, in collaboration with Government at the provincial and local levels and with interested individuals and citizen groups, develop an open planning process to produce economically and technically feasible plans for transmission and generation facilities acceptable to the public and with minimum adverse environmental impact.*

REPORT NUMBER THREE – NUCLEAR POWER IN ONTARIO

Task Force Hydro recommended that:

ENVIRONMENTAL QUALITY IMPLICATIONS

3.1 Ontario Hydro, in cooperation with Government agencies, continue to pursue a vigorous programme of research and engineering development in environmental and human protection in connection with all aspects of nuclear power plant operation, including the long-term storage and disposal of spent nuclear fuel.

FUTURE NUCLEAR POWER PROGRAM FOR ONTARIO

3.2 Nuclear power stations be of the CANDU-PHW type unless future studies and assessments reveal that some alternative type will more closely meet the needs of the Province of Ontario.

3.3 In recognition of the need to gain more operating experience and confidence with existing types of CANDU reactors and more knowledge of the economies of multiple unit manufacture, changes in design and type be resisted unless clear economic advantages can be demonstrated.

3.4 Ontario Hydro continue the assessment of other nuclear power reactors.

3.5 The existing arrangements under which A.E.C.L. undertakes basic research in support of the nuclear power programme of Ontario Hydro be replaced with formal agreements.

3.6 There be agreements between A.E.C.L. and Ontario Hydro relating to the sale by A.E.C.L. of designs, drawings, reports and manuals of Hydro's nuclear generating stations.

STRATEGIC RESOURCES

3.7 Formal steps be taken through contractual arrangements to ensure that Ontario Hydro has an assured supply of natural uranium to meet the potential requirements of its nuclear power programme, up to at least the year 2000.

3.8 Appropriate steps be taken to ensure that adequate heavy water is available in time to satisfy Ontario Hydro's planned CANDU nuclear programme and to support the further commitment of CANDU reactors in Ontario and elsewhere.

3.9 Ontario Hydro give consideration to constructing and operating heavy water production facilities adequate to assure its own supplies.

3.10 Ontario Hydro support the design, construction, and operation of CANDU reactors outside its own system by making available on reasonable terms experienced personnel but not to an extent that would prejudice its own nuclear power programme.

3.11 Ontario Hydro explore the possibility of joint ventures with private enterprise to further other sales of CANDU.

3.12 Ontario Hydro arrange annual briefing sessions to inform industry concerning its nuclear power programme.

DEVELOPMENT OF FOREIGN MARKETS

3.13 The Federal Government be urged to expand its campaign to sell CANDU reactors in Canada and abroad making use of all resources available not only within its own jurisdiction but also those in Provincial Governments and the private sector.

3.14 The Federal Government be urged to examine the feasibility of offering long-term fuel and heavy water supply contracts to foreign purchasers as an added incentive to buy CANDU reactors, subject to a requirement for security of domestic supplies and present commitments.

EDUCATION AND INFORMATION

3.15 Programmes in applied science and engineering related to nuclear technology be established in selected universities and colleges within Ontario.

3.16 (a) Ontario Hydro's Nuclear Training Centre offer selected employees of Canadian utilities and the Canadian

nuclear industry short courses of two to four weeks duration in nuclear power technology, with special reference to CANDU systems.

(b) *The possibility of the Nuclear Training Centre becoming part of the Ontario educational system be considered.*

3.17 To enhance the detailed knowledge of senior government personnel and industrialists with respect to nuclear power generation and to encourage dialogue between policy makers and nuclear scientists, short symposia be sponsored and organized by the Provincial Government and Ontario Hydro.

3.18 Ontario Hydro assume the initiative in the design and implementation of a major and sustained public information programme related to nuclear power generation in order to improve the public's knowledge of nuclear technology and enhance its appreciation of the importance to the economy of Ontario of the effective exploitation of nuclear energy.

REPORT NUMBER FOUR: HYDRO IN ONTARIO – FINANCIAL POLICY AND RATES

Task Force Hydro recommended that:

FINANCIAL OBJECTIVES FOR HYDRO

4.1 *The mix of internal and external funds be established with the objective of minimizing the cost of capital over the long-term.*

4.2 *Hydro take whatever steps are necessary to prevent any further increase in its debt/equity ratio.*

4.3 *Hydro take the initiative with Government in undertaking a periodic review of Hydro's financial performance, using rate of return on net assets as a principal criterion.*

4.4 *Surplus funds be retained by Hydro to be used at its discretion for debt retirement, rate stabilization, system expansion and to provide for contingencies.*

- 4.5 *Those sections of The Power Commission Act relating to the retirement of Hydro's debt be revised so that the only requirement is that debt be amortized over a period not in excess of 40 years.*
- 4.6 *The current charge to the cost of power for debt retirement be replaced by a charge sufficient to meet the requirements of the Corporation for internally generated funds for debt retirement and system expansion.*
- 4.7 *There be established on the balance sheet an "Accumulated Equities" account to replace the current "Equities Accumulated through Debt Retirement" charges and a "General Reserve" account to replace the "Reserve for Stabilization of Rates and Contingencies."*
- 4.8 *There be no requirement to fund any portion of the General Reserve.*

HYDRO SECURITIES ISSUES

- 4.9 *The provincial guarantee of Hydro's securities be retained.*
- 4.10 *Hydro put more emphasis on developing a market for debentures with maturities ranging from 3 to 10 years.*
- 4.11 *Hydro be prepared to sell or trade, as well as to buy its own outstanding issues as part of its debt management operations.*
- 4.12 *In addition to developing the Canadian market for its securities, Hydro continue to develop markets in the U.S. and other foreign countries.*
- 4.13 *Hydro develop a system for continuous appraisal of the performance of its financial syndicates including the managers.*

FINANCING BY THE MUNICIPAL UTILITIES

- 4.14 *Hydro and the municipal electric utilities together adopt a financial policy that seeks to minimize retail rates over the long-term, through appropriate emphasis on debt financing and using rate of return as a principal criterion.*

PRINCIPLES OF POWER COSTING

4.15 *Both demand and energy components of the bulk power rate be reviewed annually and be adjusted as circumstances warrant.*

4.16 *The practice of paying a return on accumulated "equities" of the municipal utilities and the power district be discontinued.*

4.17 *The practice of issuing 13th bills to the municipal utilities be discontinued.*

PRINCIPLES OF RATEMAKING

4.18 *Ontario Hydro adopt a pricing policy that will more accurately reflect the supply cost of electricity, and that will give effect to government policies for the allocation of capital within the energy sector.*

4.19 *Ontario Hydro's research programmes aimed at developing a uniform costing philosophy based on marginal costing be expanded to embrace studies of the feasibility and acceptability of:*

- (a) *Bulk power and retail rates that vary with the time of day and season of year; and*
- (b) *Demand charges that are based on a customer's load at the time of the monthly or seasonal system peak rather than on his individual monthly peak.*

4.20 *Except where subject to controlled disconnections, special rates based on stipulated appliance ownership, such as all-electric or water heating rates, be phased out as quickly as possible.*

4.21 *Discounts reflecting savings in marketing and certain overhead costs be granted to all large industrial customers in the form of a step reduction in the demand charge above a selected blocking point, the cost of such discounts to be spread throughout the system.*

4.22 *Hydro reduce the number of standard residential and general service rate schedules to about 15 each, from which municipal electrical utilities would agree to choose in order to fulfill their revenue needs.*

4.23 *Rates and conditions of supply be made as uniform as possible for all industries in the Province above a 5000 KW load, whether served by Hydro directly or by other suppliers.*

4.24 *The cost of a standard overhead system be included in the retail rates, with any additional cost for a higher value underground system to be borne by the new customers.*

4.25 *Means be sought to eliminate the practice in the energy industry known as "builder promotions".*

4.26 *Hydro extend every effort to reduce its reserve margin through the promotion of interruptible power contracts.*

RATE REVIEW AND APPEAL PROCEDURES

4.27 *There be established an Electricity Rate Review Board, appointed by the Lieutenant-Governor in Council, to publicly hear appeals and review proposals for changes in wholesale and direct industrial rates and to review the principles underlying the establishment of retail rates across the Province.*

GENERATION RESERVE MARGINS

- 4.28 (a) *Generating reserve margins be reviewed periodically and established by agreement between the Ontario Government and Hydro.*
- (b) *Hydro continue its efforts to improve the in-service availability of generating equipment with a view to reducing reserve margins.*

REPORT NUMBER FIVE: HYDRO IN ONTARIO – A POLICY FOR 'MAKE OR BUY'

Task Force Hydro recommends that:

TRANSFER OF TECHNOLOGY

5.1 *Hydro develop an explicit 'Make or Buy' policy which will accelerate the transfer of its technology to the private Sector and encourage greater productivity and efficiency in its operations.*

SUPPLIER DEVELOPMENT

5.2 *Hydro promote the development of specialized managerial and technical expertise within selected firms in the private sector to assure itself 'Make or Buy' alternatives for the supply of key goods, facilities and services.*

ORGANIZATION FOR 'MAKE OR BUY'

5.3 *Procedures be established to define the terms and conditions governing the use of internal and external resources and the division of responsibility and authority of Hydro managers for 'Make or Buy' decisions.*

5.4 *Maximum authority for cost/benefit analysis and 'Make' or 'Buy' decisions be vested in the managers of user groups.*

5.5 *Hydro service groups be allowed discretion in adopting organizational structures and management techniques to compete effectively with external suppliers for hydro work.*

5.6 (a) *Hydro utilize to the fullest possible extent system growth and normal attrition to offset reduced staff requirements resulting from increased levels of 'Buy'.*

(b) *Those displaced be transferred internally with retraining where necessary or, as a last resort, be provided with full assistance in relocation.*

COSTING OF INTERNAL SERVICES

5.7 *All Hydro service groups charge internal user groups on a basis which recovers the full and true cost of the services rendered, established in accordance with generally accepted accounting principles and practices.*

TENDERING AND PURCHASING POLICIES

5.8 *Hydro adopt generally a more open information policy for all forms of tendering especially where competitive bids for the supply of goods and services have been received in response to public advertisement.*

5.9 *The Government confer with other Provinces and the Federal Government to seek the elimination of interprovincial trade restrictions.*

DESIGN AND CONSTRUCTION

5.10 *Hydro seek increasingly to 'Buy' design and construction services with a view to awarding contracts:*

- (a) *For the complete detailed design and construction of selected stations projects within 5 years;*
- (b) *For the construction of selected transmission line projects within 5 years; and*
- (c) *For the detailed design and construction of selected nuclear or fossil-fired generation stations within 10 to 15 years.*

5.11 *Authority for 'Make or Buy' decisions be vested in Project Managers appointed for major generation projects and Programme Managers appointed for integrated groups of smaller capital projects.*

MAINTENANCE SERVICES

5.12 (a) *Hydro increase its use of external maintenance resources in such areas as forestry, clearing and spraying, helicopter service, and janitorial and building services.*

(b) *Hydro support the development of external facilities in addition to its own Central Maintenance Shop to ensure a 'Make or Buy' capability for the repair of major equipment.*

COMPUTER FUNCTION

5.13 *Users of Computer services become more skilled in defining their system requirements and be given responsibility for 'Make or Buy' decisions subject to corporate guidelines.*

5.14 *The role of the Computer Function to provide technical advice to Hydro users be clearly differentiated from its role to provide computer services.*

5.15 *Hydro adopt specialized single-user computer systems for use in areas with positive 'Make or Buy' potential.*

MANAGEMENT EXPERTISE

5.16 *Hydro establish a group through which to make available its specialized management and technical skill on a fee-for-service basis except in those areas that would compete directly with suppliers in the Canadian private sector.*

APPENDICES

APPENDIX 1: RECOMMENDED CHANGES
PROCUREMENT POLICIES, PROCEDURES AND PRACTICES
FOR TENDERS FOR CONSTRUCTION SERVICES

EXISTING POLICY, PROCEDURE OR PRACTICE	RECOMMENDED CHANGE	RATIONALE
<p>1. "To withhold a competitor's price from other bidders."</p> <p>No bidder's price is to be disclosed to another bidder under any consideration.</p> <p>After the business is placed with the successful bidder, any other bidder is entitled to know who received the order and in general why but not the relationship of his tender to the tender of any competitor. All unsuccessful tenderers' on purchases exceeding \$10,000.00 will be advised in writing that their tender was unsuccessful.</p> <p>(In practice, for public relations purposes, on major construction awards, a public announcement is usually made in which event the value of the award is rounded off to the nearest quarter or half million and included in the press release.)</p>	<p>To disclose information relative to tenders (for service contracts) received after the award of a contract only to those firms who have submitted proposals. This information should be restricted to total base prices received and to the rationale for the contract award.</p>	<p>Consistency with resources development policy.</p> <p>Promotion of competition.</p>
<p>2. Where a tendering document specifies accompaniment of a certified cheque for some percentage of the cost, the cheques of the three low bidders are held by the secretary and the remainder are returned.</p>	<p>Where a tender document specified accompaniment of a tender deposit for some percentage of the cost.</p> <p>Tender should be given the option of submitting</p> <ul style="list-style-type: none"> - a certified cheque or - a bid bond <p>The cheque or bonds of the three low bidders are held by the secretary and the remainder are returned.</p>	<p>Significant difference in cost to tenderer.</p> <p>Bidders may be required to tie up significant sums without benefit.</p> <p>Opportunity costs to bidders who may be unable to tender further work until results of outstanding tenders are known.</p>
<p>3. Selection of Bidders</p> <p>"A minimum of three firms must be allowed to bid where possible, etc."</p> <p>Any person or company having a product or service satisfactory to our needs may have the opportunity of bidding on our requirements.</p> <p>(In practice, this has meant that where there are a significant number of potential bidders tenders are solicited by public advertisement. In a limited number of instances, due to the complexity of the work, tenders are solicited from pre-qualified bidders or the award is negotiated.)</p>	<p>Tenders will be obtained at the discretion of management for the particular circumstances in one of the following manners.</p> <ol style="list-style-type: none"> 1. Publicly advertised fixed price tenders. 2. Publicly advertised fixed price tenders open only to pre-qualified organizations. 3. Privately solicited tenders for work to be undertaken at a firm price or fee basis including incentive and penalty arrangements. 4. Negotiated contracts. 	<p>Management discretion.</p> <p>Flexibility to use method most appropriate for requirements.</p> <p>Support of Resources Development Programs.</p>

EXISTING POLICY, PROCEDURE OR PRACTICE	RECOMMENDED CHANGE	RATIONALE
4. Process of bid analysis and evaluation is lengthy and can result in substantial delays to contract awards.	<p>a. A detailed analysis and revision of the process used for tendering and contract awards should be conducted so that contract awards can normally be made within the specified delay from receipt of tender.</p> <p>b. A pre-qualification system should be established for contractors seeking to undertake work for Hydro.</p>	<p>Bidders may be required to tie up significant sums without benefit.</p> <p>Bidders may be penalized because they are unable to bid other work while bid commitment is outstanding to Hydro.</p> <p>Hydro will be able to exercise management discretion in making contract awards on the basis of an established system using objective data, without giving the appearance of being arbitrary.</p>
5. Tender documents should state duration for which tenders must remain valid. Should evaluation process take longer than the specified delay, bidders should be given the option of withdrawing their tenders without penalty.	No change.	
6. Normally, performance bonds will be required but may be waived at discretion of Assistant Chief Engineer.	Performance bonds (material and labour payment) at Hydro's option may be required from all contractors undertaking major contracts (over \$1,000,000) for Hydro.	Reduction of risk as more work is contracted out.
7. Holdback on construction contracts is presently 15% of the value of all payments other than the final payment. (In practice, partial payment of holdback is made primarily at discretion of Hydro managers principally when work is involved at multi-unit stations.)	Holdback arrangements should be revised to provide for a 10% holdback on computed progress claims. Partial release of holdback to 2% should be permitted at "substantial completion" of the work (as defined under the terms of the Mechanics Lien Act). This partial release of holdback should not be extended to subcontractors.	Reduction in cost of work provided by contractors without undue risk to Hydro.

APPENDIX II

DESIGN AND CONSTRUCTION SERVICES

The following is an extract from a working paper prepared by the 'Make or Buy' Study Team included here to provide additional understanding of the detailed investigations conducted in relation to 'Make or Buy' Policies covering Design and Construction Services.

Long-Term Goals

The organization, scope and level of activity of Hydro's Design and Construction Services should be established in a manner to achieve the following **LONG TERM GOALS**:

- Have facilities for the generation, transformation and distribution of electricity available when required to meet the "Hydro system" demands.
- Provide facilities at the lowest acceptable overall cost compatible with high standards of quality, reliability, safety and technical innovation, with due regard to the environment and consistent with Hydro's role as a public utility and delivery agency of the Ontario Government.
- Optimize the application of technical innovation within the Hydro system.
- Have alternate resources, internal and external to Hydro, available to undertake design and construction work in a manner which minimizes risk, maintains flexibility, provides comparative data, and prevents Hydro from becoming a captive client of one external supplier in a given major area of expertise.
- Execute sufficient work through internal resources so as to maintain effective control and direction of the work.

We recommend that **HYDRO'S POLICY RELATING TO THE ACQUISITION AND PROVISION OF DESIGN AND CONSTRUCTION SERVICES** should be:

To undertake the design and construction of facilities for the generation, transformation, transmission and distribution of electricity within the following generally stated guidelines:

Owner Role – Planning and Control Functions

- To undertake primarily with its own forces all activities associated with planning the system, conceptual and definition engineering relative to generation, transformation, transmission and distribution, and relay and communication projects.
- To undertake primarily with its own forces the project management as defined later in this report, for the design and construction of fossil and nuclear generation stations, relay and communication projects, transformation stations and transmission lines.
- To have a propensity to buy project management services for hydraulic generation projects, and for miscellaneous building projects where applicable.

Supplier Role

The policies relative to Engineering Design and to Construction Services which follow are enunciated in sets of statements. Each set must be taken in full to grasp the intent of the recommended policy. Individual statements should not be taken out of context.

Engineering Design

- To utilize external resources on an integrated basis with internal design personnel and vice versa for the design of thermal generation, transformation, and relay and communication projects on a selected basis to effectively transfer technological expertise to the private sector and to increase the technical resources available to Ontario Hydro.
- To provide a sufficient volume of work to external suppliers to permit the development and retention of capabilities for the substantial total design of selected facilities at acceptable standards of performance and costs within 5 years for station projects, and 10 to 15 years for thermal (fossil or nuclear) generation stations. However, the volume of work awarded to any one organization should not be such as to place a supplier in a vulnerable position so that it is dependent on Ontario Hydro work for continuity of its business, or vice versa.
- To utilize external suppliers where possible for design packages when and where the required expertise has been demonstrated to be available and consistent with Hydro needs and policies.

- To utilize internal resources for engineering design work for all types of projects to permit Hydro to retain sufficient expertise so that it can undertake:
 - The development of new and innovative designs.
 - The production of design standards.
 - The effective evaluation and control of the design process.
 - A continuing volume of design work so as to avoid being exploited.
 - Effective communication with operations and construction relative to the design process.
 - Development of key technical and management personnel for effective engineering design and for later use in project management, concepts engineering, and definition engineering.

Construction Services

- To utilize a combination of internal and external construction capabilities for various functional areas and/or trade specialties (structural, mechanical, electrical, reinforced concrete, piping, etc.) so that major work packages required in the construction of powerhouses of thermal (fossil or nuclear) generating stations can be placed with external organizations at acceptable standards of performance and cost.
- To use external resources to undertake a substantial portion of ancillary structures associated with generating stations on a fixed, unit and/or lump sum price arrangement.
- To use external resources to undertake a substantial portion of construction associated with transformer stations and transmission lines on a fixed, unit and/or lump sum price basis.
- To use external forces to undertake the construction of buildings not associated with generating and transformer stations, such as office and service buildings on a general contractor, fixed, unit and/or lump sum price basis.
- To utilize internal construction forces on all types of projects so as:
 - To develop, maintain and expand Hydro's technical, managerial and trade supervision capabilities.

- — To permit effective evaluation and control of construction.
- To develop Hydro personnel for other areas such as project management.
- To maintain a strategic technical capability so as to avoid being exploited.
- To permit the development of new and innovative construction methods.
- To provide a sufficient volume of work to external resources to permit the development and retention of capabilities for the substantial total construction of selected thermal generation stations within 10 to 15 years and of selected lines and stations projects within 3 to 5 years at acceptable standards of cost, quality, safety and reliability.

With respect to the design and construction of generation projects and the design of station projects, it is recognized that only a few 'qualified' organizations, external to Hydro, should be utilized so that:

- Technology can effectively be transferred and the 'chosen agents' can compete in expanded domestic and foreign markets.
- Continuity of effort is maintained to maximize effectiveness and minimize learning costs.

APPENDIX III

TASK FORCE HYDRO

MEMBERS OF THE STEERING COMMITTEE

CHAIRMAN

J. D. Muncaster

President and Director

Canadian Tire Corporation Ltd.

H. A. Crothers

President

Crothers Limited

D. J. Gordon

General Manager

The Hydro-Electric Power

Commission of Ontario

R. M. Dillon

Professor of Engineering

Science

University of Western

Ontario

J. K. Reynolds

Deputy Provincial

Secretary for Resources

Development

A. Frame

Past President

Ontario Municipal

Electric Association

R. B. Taylor

Vice President

The Steel Company of

Canada Limited

H. S. Damp

Secretary

CENTRAL STAFF

R. M. Dillon

Executive Director

B. A. Baxter

Administrative Assistant

J. B. Smith

Research Director

C. A. MacFarlane

Secretary

V. J. McAfee

Administrative Terminal

Systems Operator

APPENDIX IV

TASK FORCE HYDRO MAKE OR BUY STUDY TEAM

PROJECT DIRECTOR

G. G. McKenzie Ontario Regional Partner
Urwick Currie & Partners Ltd.

MEMBERS

P. G. Campbell	Assistant Chief Engineer Design & Construction Hydro-Electric Power Commission of Ontario
H. A. Crothers	President Crothers Ltd.
R. W. Crummer	Manager Urwick Currie & Partners Ltd.
V. A. Harrison	Manager of Construction Pickering Generating Station Hydro-Electric Power Commission of Ontario
R. D. Hossack	Manager Urwick Currie & Partners Ltd.
J. N. Pretty	Manager Urwick Currie & Partners Ltd.
A. W. Rogers	Manager of Engineering Nanticoke Generating Station Hydro-Electric Power Commission of Ontario
F. P. Whitlock	Research Associate Task Force Hydro

APPENDIX V

LIAISON COMMITTEES TO THE 'MAKE OR BUY' STUDY TEAM

COMPUTER FUNCTION

W. D. Gillman	Executive Director Computers
K. J. Kane	Director Data Processing Division
J.K.A. Moore	Director Computing Services Division
E. G. Phillips	Manager Computer Planning Department
B. R. Rodie	Senior Computer Planning Analyst
M. J. Zabiuk	Manager Management Services Department

DESIGN AND CONSTRUCTION DIVISIONS

P. G. Campbell	Assistant Chief Engineer Design and Construction
D. C. Aird	Executive Assistant Generation Projects Division
M. Fraesso	Director T & D Projects Division
H. A. Jackson	Director Generation Projects Division
W. G. Morison	Assistant Director Generation Projects Division
W. E. Taylor	Director Stations Projects Division

SYSTEM MAINTENANCE DIVISION

N. D. Lindsay	Director Systems Maintenance Division
J. L. Alexander	Mechanical Maintenance Engineer
S. M. McLeod	Manager Central Maintenance Services
J. W. Simpson	Line Maintenance Engineer
B. K. Smith	Electrical Maintenance Engineer
J.E.F. Winter	Chief Forester

SUPPLY DIVISION

W. C. Cunningham	Director Supply Division
H. E. Kennedy	Assistant Director Supply Procurement
J. C. Matthew	Manager Supply Planning and Resources Development
P. R. Stratton	Assistant Director Supply Services

